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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/829,546	04/22/2004	Robert Malcolm Setbacken	8371/13	7292
757	7590	01/23/2006	EXAMINER	
BRINKS HOFER GILSON & LIONE			MONBLEAU, DAVIENNE N	
P.O. BOX 10395			ART UNIT	
CHICAGO, IL 60610			PAPER NUMBER	
			2878	

DATE MAILED: 01/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/829,546

Applicant(s)

SETBACKEN ET AL.

Examiner

Davienne Monbleau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-46 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/24/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

The IDS filed on 10/24/05 has been acknowledged and a signed copy of the PTO-1449 is attached herein.

Election/Restrictions

Applicant's arguments for election with traverse filed 10/20/05 have been carefully considered and found persuasive. Thus, the restriction has been withdrawn and all claims will be treated on the merits.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 8, 21, and 26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 26, the phrase "contact disposed between the light source and the cavity" is not clear because the light source is within the cavity.

Claim 8 recites the limitation "the wire bond and the external connector pad" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim.

Claim 21 recites the limitation "the wire bond and the external connector pad" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 15, 17, 20-22, and 24-26, to the extent taught and understood, are rejected under 35 U.S.C. 102(e) as being anticipated by Chin et al. (U.S. 2003/0193016).

Regarding claim 15, *Chin* discloses (Figure 8) a lead frame assembly comprising a lead frame (407) defining a cavity, a lead frame contact disposed within the cavity, and a sensor (402) disposed on the lead frame contact.

Regarding claim 17, *Chin* discloses (Figure 8) an external connector protruding from the lead frame (407).

Regarding claims 20 and 21, *Chin* discloses (Figure 8) an optically transparent encapsulant layer (410) disposed on the sensor (402).

Regarding claim 22, *Chin* discloses (Figure 8) that the optically transparent encapsulant layer (410) is contained within the cavity of the lead frame (407).

Regarding claim 24, *Chin* discloses (Figure 8) a cavity in the lead frame (407) for receiving a light source (401).

Regarding claim 25, *Chin* discloses (Figure 8) a light source (401) disposed within the cavity.

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Regarding claim 26, *Chin* discloses (Figure 8) a contact disposed between the light source and the cavity. It is inherent that there is some kind of contact in order to electrically connect the light source.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 18, 19, and 23, to the extent taught and understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Chin.

Regarding claims 18 and 19, *Chin* teaches (Figure 8) a leadframe (407) but does not teach the specific connection configuration of the emitter (401) and the sensor (402). It would have been obvious, however, to one of ordinary skill in the art at the time of the invention to various connection elements, such as wire bonds and pads, as they are known elements for providing efficient electrical connection of devices on circuits.

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Regarding claim 23, *Chin* teaches (Figure 8) that an optical element (404) is mounted on top of the leadframe (407) but does not teach the means of mounting. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a particular mounting means, such as a recess in the leadframe, to provide stable attachment for the optical element and prevent misalignment.

Claim 16, to the extent taught and understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Chin in view of Franklin et al. (U.S. 6,727,493).

Regarding claim 16, *Chin* teaches (Figure 8) a sensor (402), but does not teach an OPTO-ASIC sensor. *Franklin* teaches (column 4, lines 61-64) a position encoder system comprising OPTO-ASIC sensor on a circuit board. It would have been obvious to one of ordinary skill in the art at the time of the invention to use OPTO-ASIC sensors in *Chin*, as taught by *Franklin*, because they are easier to fabricate. Additionally, one of ordinary skill in the art would have been able to choose a particular sensor based on the detection needs and desired characteristics of the overall device.

Claims 1 and 3-14, to the extent taught and understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Okumura et al. (U.S. 6,803,560) in view of Chin.

Regarding claim 1, *Okumura* teaches (Figure 2) a positional encoder assembly comprising a light source (1) to generate an optical signal, an optical element support structure (8) housing a refractive optic (2) to direct the optical signal, the optical support structure (8) defining a projection, a frame defining a cavity, a hollow within which the light source (1) is disposed, and at least one recess to receive the projection, and a sensor (6) disposed within the cavity and adapted to generate an electrical signal in response to the optical signal. *Okumura*

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does not teach that the frame is a leadframe. *Chin* teaches (Figure 8) a positional encoder assembly comprising a leadframe (407) with a cavity containing a light source (401) and a sensor (402). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a leadframe in *Okumura*, as taught by *Chin*, to provide a frame with sufficient electrical connection and isolation means to electrically connect the OPTO-electronic devices. *Okumura* does not teach a circuit board. *Chin* teaches (paragraph [0014]) that a circuit board may also be used. It would have been obvious to one of ordinary skill in the art at the time of the invention to connect the frame to the circuit board, as suggested by *Chin*, to provide an efficient means to electrically connect the device to other electronic equipment, such as a processor. In this case, the leadframe would then be disposed on the circuit board assembly such that the sensor is disposed at a predetermined elevation with respect to the circuit board assembly.

Regarding claim 3, *Chin* teaches (Figure 8) that the lead frame has a contact disposed beneath the sensor.

Regarding claim 4, *Chin* teaches (Figure 8) an external connector protruding from the lead frame. *Chin* does not teach that the external connector is connectable to the circuit board assembly. It would have been obvious, however, to one of ordinary skill in the art at the time of the invention that the external connect is connectable to the circuit board in order to output the detected signal and send it to a processor.

Regarding claim 5 and 6, *Okumura* in view of *Chin* teaches a leadframe (407) with an external connector but does not teach the specific connection configuration of the emitter (401) and the sensor (402). It would have been obvious, however, to one of ordinary skill in the art at

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the time of the invention to various connection elements, such as wire bonds and pads, as they are known elements for providing efficient electrical connection of devices on circuits.

Regarding claims 7 and 8, *Okumura* teaches (Figure 2) that the cavity is enclosed, but does not specifically teach an encapsulant. *Chin* teaches (Figure 8) an optically transparent encapsulant layer (410) disposed on the sensor (402). It would have been obvious to one of ordinary skill in the art at the time of the invention to use an encapsulant in *Okumura*, as taught by *Chin*, to isolate the emitter/sensor from harmful external effects and stabilize its operating conditions.

Regarding claim 9, *Chin* teaches (Figure 8) that the optically transparent encapsulant layer (410) is contained within the cavity of the leadframe (407).

Regarding claim 10, *Okumura* teaches (Figure 2) a code scale (4), but does not teach that it is a disc or that it is disposed between the optical support structure (8) and the leadframe. *Chin* teaches (Figure 8) a code disc disposed between an optical element (404) and the leadframe (407). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a particular scale (i.e. code disc) in *Okumura*, as taught by *Chin*, based upon the object whose position needs to be detected. It would have been obvious to one of ordinary skill in the art at the time of the invention to place the code disc in a particular configuration in *Okumura*, such as of that in *Chin*, based upon arrangement of the optical elements, the object to be detected, and the desired detection characteristics.

Regarding claim 11, *Okumura* teaches (Figure 2) a lens (2) but does not teach that it is prismatic. It would have been obvious, however, to one of ordinary skill in the art at the time of

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the invention to use a particular type of lens (i.e. prismatic) based upon the desired optical characteristics of the device and the particular need for controlling the light.

Regarding claims 12-14, *Okumura* in view of *Chin* teaches that the light source and sensor would have predetermined elevations but does not teach the specific value of the predetermined elevations. It would have been obvious, however, to one of ordinary skill in the art at the time of the invention to use a particular structure arrangement, such as a predetermined height, based on the desired characteristics for the overall device, as well as the focusing needs of the optical elements.

Claims 27, 28, 30-38, and 40-46, to the extent taught and understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Chin in view of Okumura.

Regarding claim 27, *Chin* teaches (Figure 2) a positional encoder assembly comprising a light source (401) to generate an optical signal, a leadframe (407), the leadframe defining a first cavity and a hollow within which the light source (401) is disposed, a connector located externally to the leadframe, and a sensor (6) disposed within a second cavity supported upon a leadframe contact and adapted to generate an electrical signal in response to the optical signal. *Chin* teaches (paragraph [0014]) that a circuit board may also be used. It would have been obvious to one of ordinary skill in the art at the time of the invention to connect the leadframe to the circuit board to provide an efficient means to electrically connect the device to other electronic equipment, such as a signal processor. In this case, the leadframe would then be disposed on the circuit board assembly such that the sensor is disposed at a predetermined elevation with respect to the circuit board assembly and connectors. *Chin* does not teach the specific connection configuration of the emitter (401) and the sensor (402). It would have been

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obvious, however, to one of ordinary skill in the art at the time of the invention to various connection elements, such as wire bonds and pads, as they are known elements for providing efficient electrical connection of devices on circuits. It would have also been obvious to one of ordinary skill in the art at the time of the invention to use a particular connector configuration based on the individual characteristics of each element. Lastly, *Chin* teaches (Figure 8) that the first and second cavity is the same cavity, but does not teach two separate cavities. *Okumura* teaches (Figure 2) a positional encoder device comprising a frame with individual cavities for the sensor and detector. It would have been obvious to one of ordinary skill in the art at the time of the invention to use separate cavities in *Chin*, as taught by *Okumura*, to shield the detector from ambient light that could affect the accuracy of the detection.

Regarding claim 37, *Chin* teaches (Figure 2) a positional encoder assembly comprising a light source (401) to generate an optical signal, a leadframe (407), the leadframe defining a first cavity and a hollow within which the light source (401) is disposed, a connector located externally to the leadframe, and a sensor (6) disposed within a second cavity supported upon a leadframe contact and adapted to generate an electrical signal in response to the optical signal. *Chin* teaches (paragraph [0014]) that a circuit board may also be used. It would have been obvious to one of ordinary skill in the art at the time of the invention to connect the leadframe to the circuit board to provide an efficient means to electrically connect the device to other electronic equipment, such as a signal processor. In this case, the leadframe would then be disposed on the circuit board assembly such that the sensor is disposed at a predetermined elevation with respect to the circuit board assembly and connectors. *Chin* does not teach the specific connection configuration of the emitter (401) and the sensor (402). It would have been

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obvious, however, to one of ordinary skill in the art at the time of the invention to various connection elements, such as wire bonds and pads, as they are known elements for providing efficient electrical connection of devices on circuits. It would have also been obvious to one of ordinary skill in the art at the time of the invention to use a particular connector configuration based on the individual characteristics of each element. Lastly, *Chin* teaches (Figure 8) that the first and second cavity is the same cavity, but does not teach two separate cavities. *Okumura* teaches (Figure 2) a positional encoder device comprising a frame with individual cavities for the sensor and detector. It would have been obvious to one of ordinary skill in the art at the time of the invention to use separate cavities with specific relative heights in *Chin*, as taught by *Okumura*, to shield the detector from ambient light that could affect the accuracy of the detection.

Regarding claims 28 and 38, *Chin* teaches (Figure 8) an optical element (404) to direct the optical signal that is mounted to the top of the leadframe (407) but does not teach the means of mounting. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a particular mounting means, such as a protrusion and recess structure, to provide stable attachment for the optical element and prevent misalignment.

Regarding claims 30 and 40, *Chin* teaches (Figure 8) an optically transparent encapsulant layer (410) disposed on the sensor (402).

Regarding claims 31 and 41, *Chin* teaches (Figure 8) an optically transparent encapsulant layer (410), but does not teach that it encapsulates the wire bonds and connector pads. It would have been obvious, however, to one of ordinary skill in the art at the time of the invention to

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encapsulate the connector elements to isolate the emitter/sensor and connector elements from harmful external effects and stabilize its operating conditions.

Regarding claims 32 and 42, *Chin* teaches (Figure 8) that both the emitter and sensor have an optically transparent encapsulant layer (410). Thus, the encapsulant layer would be contained in both cavities.

Regarding claims 33 and 43, *Chin* teaches (Figure 8) a code disc disposed between an optical element (404) and the leadframe (407).

Regarding claims 34 and 44, *Chin* teaches (Figure 8) a reflective optical element (404) but does not teach a refractive lens. *Okumura* teaches (Figure 2) a lens (2) but does not teach that it is prismatic. It would have been obvious, however, to one of ordinary skill in the art at the time of the invention to use a particular type of optical configuration (i.e. prismatic lens) based upon the desired optical characteristics of the device and the particular need for controlling the light.

Regarding claims 35 and 45, *Chin* in view of *Okumura* teaches that the light source and sensor would have predetermined elevations but does not teach the specific value of the predetermined elevations. It would have been obvious, however, to one of ordinary skill in the art at the time of the invention to use a particular structure arrangement, such as a predetermined height, based on the desired characteristics for the overall device, as well as the focusing needs of the optical elements.

Regarding claims 36 and 46, *Chin* teaches (Figure 8) that the light source (401) lies above the leadframe contact.

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Claim 2, to the extent taught and understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Okumura in view of Chin, as applied to claim 1 above, and in further view of Franklin.

Regarding claim 2, *Okumura* in view of *Chin* teaches (Figure 8) a sensor (402), but does not teach an OPTO-ASIC sensor. *Franklin* teaches (column 4, lines 61-64) a position encoder system comprising OPTO-ASIC sensor on a circuit board. It would have been obvious to one of ordinary skill in the art at the time of the invention to use OPTO-ASIC sensors in *Chin*, as taught by *Franklin*, because they are easier to fabricate. Additionally, one of ordinary skill in the art would have been able to choose a particular sensor based on the detection needs and desired characteristics of the overall device.

Claims 29 and 39, to the extent taught and understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Chin in view of Okumura, as applied to claims 27 and 37 above, respectively, and in further view of Franklin.

Regarding claims 29 and 39, *Chin* in view of *Okumura* teaches (Figure 8) a sensor (402), but does not teach an OPTO-ASIC sensor. *Franklin* teaches (column 4, lines 61-64) a position encoder system comprising OPTO-ASIC sensor on a circuit board. It would have been obvious to one of ordinary skill in the art at the time of the invention to use OPTO-ASIC sensors in *Chin*, as taught by *Franklin*, because they are easier to fabricate. Additionally, one of ordinary skill in the art would have been able to choose a particular sensor based on the detection needs and desired characteristics of the overall device.

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Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure because they teach various emitter/sensor configurations for a position encoder.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Davienne Monbleau whose telephone number is 571-272-1945.

The examiner can normally be reached on Monday through Friday 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 571-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Davienne Monbleau

DNM

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